CLAIMS

What is claimed is:

1. An implantable cardiac defibrillation assembly comprising:

at least one implantable lead including a defibrillation electrode adapted for placement in a chamber of the heart and including a connector; and

an implantable defibrillation device having a pulse generator that provides defibrillation pulses and that is configured to receive the connector to couple the defibrillation electrode to the pulse generator, the device further including a system that evaluates and conditions the assembly to provide defibrillation therapy to the heart without requiring arrhythmia induction of the heart, wherein the system is operative to generate a test pulse, measure an electric field resulting from the test pulse, and to determine a defibrillation threshold based on the electric field generated by the test pulse.

2. The assembly of claim 1 wherein the at least one implantable lead has a lead DC resistance between the connector and the defibrillation electrode, and wherein the assembly further comprises a DC resistance measuring circuit that measures the lead DC resistance responsive to the device receiving the connector coupling the defibrillation electrode to the pulse generator.

3. The assembly of claim 2 further comprising a display that displays the measured lead DC resistance.

4. The assembly of claim 2 further comprising an alarm that provides a perceptible indication when the lead DC resistance is outside of a predetermined DC resistance range.

5. The assembly of claim 1 further including a ventricular sensing electrode that senses ventricular electrical activity including R waves of the heart, wherein the device includes a ventricular sensing circuit that is adapted to be coupled to the ventricular sensing electrode that senses the ventricular activity sensed by the ventricular sensing electrode, and wherein the system further comprises a confirmation circuit that confirms that the sensing ventricular electrode and ventricular sensing circuit are able to sense R waves of the heart.

6. The assembly of claim 5 wherein the confirmation circuit confirms acceptable R wave amplitude and/or slew rate.

7. The assembly of claim 5 further including an atrial sensing electrode that senses atrial activity including P waves of the heart, wherein the device includes an atrial sensing circuit that is adapted to be coupled to the atrial sensing electrode that senses the atrial activity sensed by the atrial sensing electrode, and wherein the confirmation circuit confirms sensing of an R wave corresponding to each sensed P wave.

8. The assembly of claim 7 wherein the device includes a relatively long AV delay to enable sensing of conducted R waves.

9. The assembly of claim 5 wherein the device includes a relatively long escape interval.

10. The assembly of claim 1 wherein the system is operative to set the pulse generator to a defibrillation voltage above the defibrillation threshold.

11. The assembly of claim 1 wherein the device includes a ventricular pacing pulse generator that provides ventricular pacing pulses, wherein the assembly further comprises near-field and far-field pacing electrode configurations, and wherein the estimating circuit measures near-field and far-field pacing thresholds.

12. The assembly of claim 1 wherein the device includes a conductive enclosure, wherein the estimating circuit causes the pulse generator to apply a test pulse of a given voltage between the device enclosure and the defibrillation electrode and wherein the estimating circuit measures an induced voltage induced by the test pulse and indicative of a corresponding defibrillation electrical field.

13. A defibrillation lead assembly comprising:

a defibrillation lead including a connector and at least one defibrillation electrode coupled to the connector;

a sealed enclosure enclosing the defibrillation lead;

a first conductor coupled to the connector and extending through the sealed enclosure, and

a second conductor coupled to the defibrillation electrode and extending through the sealed enclosure, whereby

the first and second conductors may be used to measure the DC resistance between the defibrillation electrode and the connector.

14. An implantable cardiac defibrillation assembly comprising:

implantable lead means including a defibrillation electrode for making electrical contact with a chamber of the heart and including a connector; and

device means having pulse generating means for providing defibrillation pulses and being configured for receiving the connector for coupling the defibrillation electrode to the pulse

generating means, the device means further comprising means for generating a test pulse, means for measuring an electric field resulting from the test pulse, and means for determining a defibrillation threshold based on the electric field generated by the test pulse.

15. The assembly of 14 wherein the device comprises ventricular pacing pulse generating means for providing near-field and far-field ventricular pacing pulses, and wherein the means for determining comprises means for measuring near-field and far-field pacing thresholds.

16. In a procedure of implanting a cardiac defibrillation assembly, the method comprising:

providing at least one implantable lead including a defibrillation electrode adapted for placement in a chamber of the heart and including a connector;

providing an implantable defibrillation device having a pulse generator that provides defibrillation pulses and that is configured to receive the connector to couple the defibrillation electrode to the pulse generator; and

generating a test pulse, measuring an electric field resulting from the test pulse, and determining a defibrillation threshold based on the electric field generated by the test pulse.

17. The method of claim 16 wherein determining a defibrillation threshold comprises providing ventricular near-field and far-field pacing pulses, and measuring near-field and far-field pacing thresholds.

18. The method of claim 16 wherein determining the defibrillation threshold comprises performing a plurality of different threshold estimates and thereafter computing a threshold average from the plurality of estimates.